

Remarks

Reconsideration of this Application is respectfully requested. Upon entry of the foregoing amendment, claims 1-46 and 49-51 are pending in the application, with 1, 11, 23, 30, 37, 40, 43 and 46 being the independent claims. Based on the above amendment and the following remarks, Applicant respectfully requests that the Examiner reconsider all outstanding objections and rejections and that they be withdrawn.

Independent Claims 1 and 11

The Examiner rejected independent claims 1 and 11 under 35 U.S.C. § 101. In support, the Examiner stated that "claims 1-22 and 51 don't produce any practical application, then don't claim what the channel model is for, and they only make the manipulation of an abstract idea that is not concrete or tangible." (Office Action, p. 5.) In response, Applicant has amended independent claims 1 and 11 to clearly illustrate that the channel model is used to identify and compensate for channel non-linearities. Support for the amendment may be found at, for instance, at paragraphs 0051 and 0090.

Applicant believes that these amendments render the rejection under 35 U.S.C. § 101 moot. Accordingly, Applicant respectfully requests that this rejection be reconsidered and withdrawn for independent claims 1 and 11, as well as for dependent claims 2-10, 12-22 and 51.

The Examiner also rejected independent claims 1 and 11 under 35 U.S.C. § 102(b) over Sands, Nicolas P. & Cioffi, John M., "Non-linear Identification on the Digital Magnetic Recording Channel," IEEE (1991) ("Sands"). (Office Action, p. 6.) With the current amendment, claims 1 and 11 now recite the steps of "*identifying non-linearities in the optical fiber data channel based on the adjusted channel model; and compensating for the non-linearities to enhance channel performance.*" Applicants

respectfully assert that these amendments render the Examiner's rejections over Sands moot. Sands does not teach the identification and correction of non-linearities identified by the model--it merely teaches the identification of a "digital magnetic recording channel in which data dependent nonlinear effects are present." (Sands, Abstract.)

For at least the above reasons, Applicant respectfully requests that the rejections of independent claims 1 and 11 be reconsidered and withdrawn. Applicant similarly requests that the rejections of dependent claims 2-20, 12-22 and 51 be reconsidered and withdrawn as they depend from patentable base claims.

Independent Claims 23 and 30

The Examiner rejected independent claims 23 and 30 as being obvious under 35 U.S.C. § 103(a) over Sands and in further view of U.S. Patent No. 4,747,094 to Sakaguchi *et al.* ("Sakaguchi") and Agarossi, Luigi, *et al.*, "An Effective Non-Linear Receiver for High Density Optical Disc," IEEE Global Telecommunications Conference, vol. 6; pp. 3374-87(GLOBECOM 1998) ("Agarossi"). (Office Action, p. 9-11.)

In making the obviousness rejection, the Examiner has attempted to cobble together the teachings of three disparate references. Sands is directed to "identifying the digital magnetic recording channel in which data dependent non-linear effects are present." (Abstract). Sakaguchi describes a "signal coupler" that "couples more than three transmitter-receivers through optical fiber cables and at least one repeater on a bit-multiplex system." (Abstract) Aragossi describes a non-linear receiver for a high density optical channel. (Abstract)

Applicant asserts that the Examiner has not met the burden of showing a *prima facie* case of obviousness. More specifically, the Examiner's conclusory arguments regarding motivation to combine the three cited references are insufficient. According to

the Examiner, "it would have been obvious to a person of ordinary skill in the art to incorporate in the optical channel receiver disclosed by Sakaguchi and Agarossi the nonlinear channel identification disclosed by Sands. The suggestion/motivation for doing so would have been to minimize the means-squared error." Applicant respectfully asserts that this statement is both factually and legally deficient.

First, contrary to the Examiner's assertion, Sakaguchi does not disclose an optical channel receiver. Rather, Sakaguchi discloses a signal coupling system. Further, Sakaguchi does not teach or suggest using means-squared error as a metric for analyzing system performance. The Examiner's assertions with respect to Sakaguchi are thus factually deficient.

Second, the Examiner's one sentence rational for suggestion/motivation to combine is legally deficient. As a matter of law, the Examiner is required to rely on objective evidence and to make specific factual findings with respect to the motivation to combine references. *In re Lee*, 277 F.3d 1338, 1342-44 (Fed. Cir. 2000); MPEP § 2143.01. The Examiner made no such findings and has thus not met this burden.

For at least these reasons, the Examiner's rejection of independent claims 23 and 30 should be reconsidered and withdrawn. The Examiner's rejection of dependent claims 24-29 and 31-36 should be similarly reconsidered and withdrawn as they depend from patentable base claims 23 and 30 respectively.

Independent Claims 37 and 40

The Examiner rejected independent claims 37 and 40 under 35 U.S.C. § 102(b) over Agarossi. (Office Action, p. 8-9.) Applicant respectfully asserts that Agarossi does not teach or suggest each element of claims 37 and 40.

More specifically, independent claims 37 and 40 both explicitly state that the nonlinear channel estimator has "*a memory width*" and that the branch metrics are computed "over a number of states based on expected values of the received signal, *wherein the number of states corresponds to the memory width.*" This feature of independent claims 37 and 40 is not taught or suggested by Agarossi.

For this reason, Applicant respectfully requests that the rejection of independent claims 37 and 40 be reconsidered and withdrawn. The Examiner's rejection of dependent claims 38, 39, 41 and 42 should be similarly reconsidered and withdrawn as they depend from patentable base claims 37 and 40.

Independent Claims 43 and 46

The Examiner rejected independent claims 43 and 46 under 35 U.S.C. § 103(a) as being unpatentable over Sakaguchi in view of Agarossi. As with independent claims 23 and 30, the Examiner's obviousness rejection of independent claims 43 and 46 is both legally and factually deficient. More specifically, the Examiner has factually mischaracterized Sakaguchi and has not provided a legally sufficient rationale for the suggestion or motivation to combine Sakaguchi and Agarossi.

First, the Examiner stated that "it would have been obvious to a person of ordinary skill in the art to incorporate in the optical channel receiver disclosed by Sakaguchi the nonlinear estimator disclosed by Agarossi." (Office Action p. 15.) The problem with this statement is that Sakaguchi does not teach or disclose an optical channel receiver. Rather, Sakaguchi relates to signal coupling system for an optical repeater system. The Examiner's rationale is thus factually erroneous and deficient.

Second, the Examiner stated that "[t]he suggestion/motivation for [combining the Sakaguchi and Agarossi references] would have been to reduce the nonlinear ISI."

(Office Action, p. 15.) This single inaccurate statement is deficient. As a matter of law, the Examiner is required to rely on objective evidence and to make specific factual findings with respect to the motivation to combine references. *In re Lee*, 277 F.3d 1338, 1342-44 (Fed. Cir. 2000); MPEP § 2143.01. The Examiner made no such findings and has not met this burden. Indeed, there is no mention of non-linear ISI in Sakaguchi at all.

For at least these reasons, Applicant respectfully requests that the Examiner reconsider and withdraw the rejection of independent claims 43 and 46. The Examiner's rejection of dependent claims 44, 45, 49 and 50 should be similarly reconsidered and withdrawn as they depend from patentable base claims 43 and 46.

Rejections Under 35 U.S.C. § 112

The Examiner rejected dependent claims 15 and 19 under 35 U.S.C. § 112 because there was insufficient antecedent basis for the claim 15 feature reciting "the difference between the channel model value and the output of the channel...." Applicant has amended claim 15 to address this issue. Applicant therefore respectfully requests that the Examiner reconsider and withdraw the rejection of claims 15 and 19.

Conclusion

All of the stated grounds of rejection have been properly traversed, accommodated, or rendered moot. Applicant therefore respectfully requests that the Examiner reconsider all presently outstanding rejections and that they be withdrawn. Applicant believes that a full and complete reply has been made to the outstanding Office Action and, as such, the present application is in condition for allowance. If the Examiner believes, for any reason, that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at the number provided.

Prompt and favorable consideration of this Amendment and Reply is respectfully requested.

Respectfully submitted,

STERNE, KESSLER, GOLDSTEIN & FOX P.L.L.C.



Jon E. Wright
Attorney for Applicant
Registration No. 50,720

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1100 New York Avenue, N.W.
Washington, D.C. 20005-3934
(202) 371-2600

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